

The Invention Claimed Is

1. A method of sealing an opening between two blood conduit lips, comprising:

providing a clip;
first retracting a first lip into said clip;
second retracting a second lip into said clip; and
providing a pharmaceutical at said seal.

2. A method according to claim 1, wherein said pharmaceutical comprises a clot enhancing pharmaceutical.

3. A method according to claim 1, wherein providing comprises providing a layer of material comprising said pharmaceutical.

4. A method according to claim 3, wherein said layer is provided between said lips

5. An anastomotic connector for attaching two blood vessels, comprising:

a cylinder-like portion defining a lumen, having two ends and comprising an array of cells-elements; and

a tissue engaging portion comprising at least one set of spikes comprising at least one spike arranged adjacent one of the two ends of said cylinder-like portion.

6. A connector according to claim 5, comprising at least a second set of spikes adjacent the other of the two ends.

7. An anastomotic connector for attaching two blood vessels, comprising:

a cylinder-like portion defining a lumen; and
a plurality of tissue engaging portions for engaging two blood vessels, said plurality comprising at least one spike, wherein radial expansion of said cylinder-like portion causes said at least one spike to engage tissue, wherein said cylinder-like portion comprises a plurality of cell elements.

8. An anastomotic connector for attaching two blood vessels, comprising:

a cylinder-like portion defining a lumen; and
a plurality of tissue engaging portions for engaging two blood vessels, wherein radial expansion of said cylinder-like portion is coupled to axial contraction of said cylinder-like portion, wherein said cylinder-like portion comprises a plurality of cell elements.

9. A connector according to claim 6 or 7, wherein said at least one spike is arranged to extend out of said lumen when said tissue engaging portions engage tissue in a completed anastomosis.

10. A connector according to claim 9, wherein said extended spike lies in a plane perpendicular to said cylinder-like portion.

11. A connector according to claim 6 or 7, wherein said device is arranged to release said at least one spike to assume an extended configuration by an expansion of said cylinder-like portion.

12. A connector according to claim 6 or 7, wherein said spike comprises a protrusion to prevent engaged tissue from slipping off said spike.

13. A connector according to claim 6 or 7, wherein said spike comprises a protrusion to prevent engaged tissue from slipping along said spike beyond said protrusion.

14. A connector according to claim 6 or 7, wherein said spike is arranged to bend at least 90° when it extends.

15. A connector according to claim 6 or 7, wherein said spike is arranged to bend at least 150° when it extends.

16. A connector according to claim 6 or 7, wherein said spike is arranged to bend at least 180° when it extends.

17. A connector according to claim 6 or 7, wherein said spike is arranged to bend at least 210° when it extends.

18. A connector according to claim 6 or 7, wherein said spike is arranged to bend at at least two points thereon when it extends.

19. A connector according to claim 6 or 7, wherein said spike is arranged to bend in a continuous curve when it extends.

20. A connector according to claim 6 or 7, wherein said at least one spike comprises at least two spikes and wherein said connector comprises at least a second spike and wherein said second spike is arranged to bend towards said at least one spike and said at least one spike is arranged to bend towards at least a second spike.

21. A connector according to claim 20, wherein spikes of said at least a second spike are arranged to be in a same plane as spikes of said at least one spike, when the spikes are in a bent configuration.

22. A device according to any of claims 5-8, wherein said lumen has an elliptical cross-section.

23. A device according to any of claims 5-8, wherein said lumen has a circular cross-section.

24. A device according to any of claims 5-8, wherein said lumen has a polygonal cross-section.

25. A device according to any of claims 5-8, wherein said lumen has a varying inner diameter, wherein said inner diameter has an hourglass profile, being flared at the ends of the lumen.

26. A device according to any of claims 5-8, wherein said lumen has a varying inner diameter, wherein said lumen is flared at one end of the lumen.

27. A device according to any of claims 5-8, wherein a cross-section of said lumen varies along said lumen.

28. A device according to any of claims 5-8, wherein said lumen is matched to a coronary vessel.

29. A device according to any of claims 5-8, wherein at least one of said cell elements has parallelogram geometry.

30. A device according to any of claims 5-8, wherein at least one of said cell elements is arranged to distort out of a plane of said cell, when that cell is expanded along a certain axis thereof.

31. A device according to any of claims 5-8, wherein at least one of said cell elements comprises an outline geometrical shape.

32. A device according to any of claims 5-8, wherein at least one of said cell elements is not planar.

33. A device according to any of claims 5-8, wherein said cells are arranged as bands on at least a portion of said cylinder-like portion, each of said bands comprising substantially a single type of parallelogram.

34. A device according to claim 33, wherein said bands are axial bands.

35. A device according to claim 33, wherein said bands are circumferential bands.

36. A device according to any of claims 5-8, wherein substantially all of said cylinder-like portions is composed of cell-elements.

37. A device according to any of claims 5-8, wherein said cell elements meet at junctions and comprising at least one substantially rigid strut interconnecting at least two junctions.

38. A device according to any of claims 5-8, wherein said cell elements meet at junctions and comprising at least one substantially flexible wire interconnecting at least two junctions.

39. A device according to any of claims 5-8, wherein said cylinder-like portion comprises several cell types and wherein said cell types are uniformly distributed on said cylinder-like portion.

40. A device according to any of claims 5-8, wherein said cylinder-like portion comprises at least one part which comprises a temperature-triggered shape-memory material.

41. A device according to any of claims 5-8, wherein said at least one of tissue engagers comprises at least one part which comprises a temperature-triggered shape-memory material.

42. A device according to any of claims 5-8, wherein said anastomotic connector is adapted to engage a side of one of said vessels and an end of another of said vessels, to perform a side-to-end anastomosis.

43. A device according to claim 42, wherein said anastomosis is sealed by radial pressure exerted by said cylinder-like portion and wherein said tissue engagers maintain the cylinder-like portion in its position.

44. A device according to claim 42, wherein said tissue engagers maintain the relative positions of the two blood vessels.

45. A device according to claim 42, wherein said tissue-engaging portions are arranged on said cylinder-like portion such that when the anastomosis is complete, the cylinder like portion is at a certain angle perpendicular to the "side" vessel.

46. A device according to claim 42, wherein said certain angle is between about 70° and about 90°.

47. A device according to any of claims 5-8, wherein at least one of said tissue engagers is adapted to engage an everted graft.

48. A device according to any of claims 5-8, wherein at least one of said tissue engagers is adapted to both an everted and a non-everted graft.

49. A method of implanting a clip from inside a blood vessel, comprising:

providing a clip having at least two spikes inside the blood vessel;

spreading apart the spikes and maintaining them in said spread configuration;

retracting said clip such that said clip engages said blood vessel on either side of a hole in said vessel; and

releasing said clip.

50. A method according to claim 49, wherein releasing said clip comprises releasing at least one end of a thin cable that holds said clip in a loop of said cable.

51. A method according to claim 49, comprising releasing said spikes from said spread configuration after said retracting.

52. An anastomotic connector for connecting a graft to a target vessel, comprising:

a thin collar section, adapted to engage a portion of the graft; and

a separate spike section, adapted to mount on said collar section and comprising a plurality of spikes, each of said spikes adapted to transfix said graft.

53. A connector according to claim 52, wherein said spike section comprises a super-elastic material.

54. A connector according to claim 52, wherein said spikes are pre-bent in a hook shape, such that said hook shape is adapted to engage the target vessel.

55. A connector according to claim 52, wherein said collar section defines a cylindrical volume.

56. A connector according to claim 52, wherein said collar section is adapted to form a perpendicular anastomosis.

57. A connector according to claim 52, wherein said collar section is adapted to form an oblique anastomosis.